

7.1.18 Regeneration of Heat Exchanger 1B/2B

1. Purpose

This procedure provides instructions for regenerating heat exchanger 1B/2B on the RHIC 25 kW Helium Refrigerator. This procedure shall be performed when heat exchanger 1B/2B is contaminated and has been taken offline. The steps necessary to take heat exchanger 1B/2B offline are not covered under this procedure, please reference [C-A OPM 7.1.15](#).

2. Responsibilities

- 2.1 The shift supervisor or an operator designated by the shift supervisor is responsible for conducting the procedure and providing documentation in the Cryogenic Control Room Log.
- 2.2 Should a problem arise in the process of regenerating the heat exchanger, the shift supervisor shall report to the technical supervisor for instructions before continuing.

3. Prerequisites

- 3.1 Operator shall be familiar with the refrigerator P&ID drawing 3A995009, the physical location of components on the refrigerator, and the refrigerator control pages found on the CRISP control system.
- 3.2 The regeneration skid must be available for use.
- 3.3 Oxygen monitor and hygrometer in compressor room are set to read compressor discharge.

4. Precautions

- 4.1 If there is liquid helium in the refrigerator pots, all personnel entering the refrigeration wing of 1005R must be ODH Class 1 qualified have a Personal Oxygen Monitor (POM) and carry an emergency escape pack, if the refrigerator is operating.

5. Procedure

_____ 5.1 Date _____

_____ 5.2 The following valves shall be set to the CLOSED position:

Process Valves:

H714A_____	H716M_____	H724M_____
H715M_____	H717M_____	H713M_____

Valves to atmosphere, relief valve header, vacuum, or pure helium:

H719M_____	H856M_____	H9200M_____
H721M_____	H857M_____	H9195M_____
H723M_____	H1102A_____	H706M_____
H848M_____	H9198M_____	H305M_____
H855M_____	H9199M_____	

_____ 5.3 Ensure the following valves are OPEN:

Process Valves:

H822M_____

_____ 5.4 Start the regeneration (regen) skid per [C-A-OPM 7.1.36](#), "Regeneration System Normal Operation".

_____ 5.5 Open the following valves:

H9107M_____	H722M_____
H9108M_____	H9110M_____
H9109M_____	H847M_____
H718M_____	H9106M_____
H720M_____	H705M_____

_____ 5.6 Close regen manifold bypass valve H9100M.

_____ 5.7 Turn on regen skid pre-heater.

_____ 5.8 Monitor sensors TI708, TI709, TI710, TI711, TI868, TI869, TI870, TI251, TI252, and TI253.

_____ 5.9 When the above sensors reach 310°K, continue to regenerate for at least 1 hour. Hygrometer reading must be -30°C to -40°C and improving less than 0.5°C/hr.

- _____ 5.10 Turn off regen skid preheater.
- _____ 5.11 Open valve H9100M.
- _____ 5.12 Close the following valves:
- | | |
|-------------|-------------|
| H705M_____ | H722M_____ |
| H847M_____ | H9107M_____ |
| H9110M_____ | H9108M_____ |
| H718M_____ | H9109M_____ |
| H720M_____ | |
- _____ 5.13 Secure the regeneration skid per [C-A-OPM 7.1.36](#).
- _____ 5.14 Introduce pure helium into heat exchanger 1B/2B by cracking open valve H706M_____. Immediately crack open the following valves to purge heat exchanger 1B/2B:
- | | |
|------------|------------|
| H719M_____ | H855M_____ |
| H721M_____ | H856M_____ |
| H723M_____ | H857M_____ |
- _____ 5.15 Adjust valves in previous step as necessary until an audible purge is heard.
- _____ 5.16 Allow heat exchanger 1B/2B to purge for 30 minutes at an audible level.
- _____ 5.17 Close the following valves:
- | | |
|------------|------------|
| H719M_____ | H855M_____ |
| H721M_____ | H856M_____ |
| H723M_____ | H857M_____ |
- _____ 5.18 When PI844H reaches approximately 250 PSIA, close valves H706M_____ and H9106M_____.
- _____ 5.19 Open valves H715M_____, H716M_____ and H717M_____ as a sign that heat exchanger 1B/2B has been regenerated and is ready for service.

6. Documentation

- 6.1 The check-off lines on the procedure are for place-keeping only. The procedure is not to be initialed or signed, it is not a record.
- 6.2 The Shift Supervisor, or designee, shall document the completion of the procedure in the Cryogenics Control Room Log.

7. References

- 7.1 Drawing 3A995009, 25KW Helium Refrigerator P&ID.
- 7.2 [C-A-OPM 7.1.15](#), "Heat Exchanger 1A/2A Online and Heat Exchanger 1B/2B Offline".
- 7.3 [C-A-OPM 7.1.36](#), "Regeneration System Normal Operation".

8. Attachments

- 8.1 None